eauc
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UWE Bristol University of the West of England
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CarbonCredentials
LEARNING AND LEGACY THE ROLE OF EDUCATION IN CREATING HEALTHIER, HAPPIER CITIES
EAUC 20th Annual Conference 25th - 26th May 2016

Data Centre Anywhere

Micro Data Centres

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Estates and Operations

Increasing Pressure

… on data centre planning and operation

Estates and Operations

Increasing availability expectations

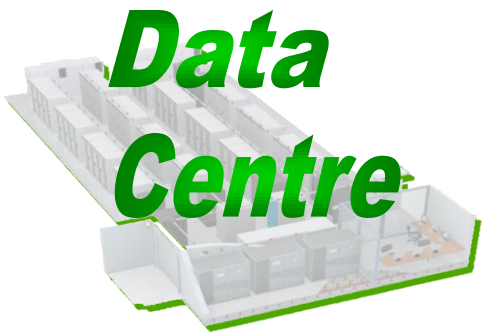
Cloud computing

Energy efficiency

Virtualization

Energy and service cost control

Uncertain long-term plans for capacity or density



Dynamic power variation

Regulatory requirements

Server consolidation

In response …

Providers are continuing to improve new ways to plan, design, install, manage, and maintain data centres

Increasing Opportunity

… for data centre planning and operation

Estates and Operations

Increasing availability expectations

Cloud computing

Energy efficiency

Virtualization

Energy and service cost control

Uncertain long-term plans for capacity or density

Dynamic power variation

Regulatory requirements

Server consolidation

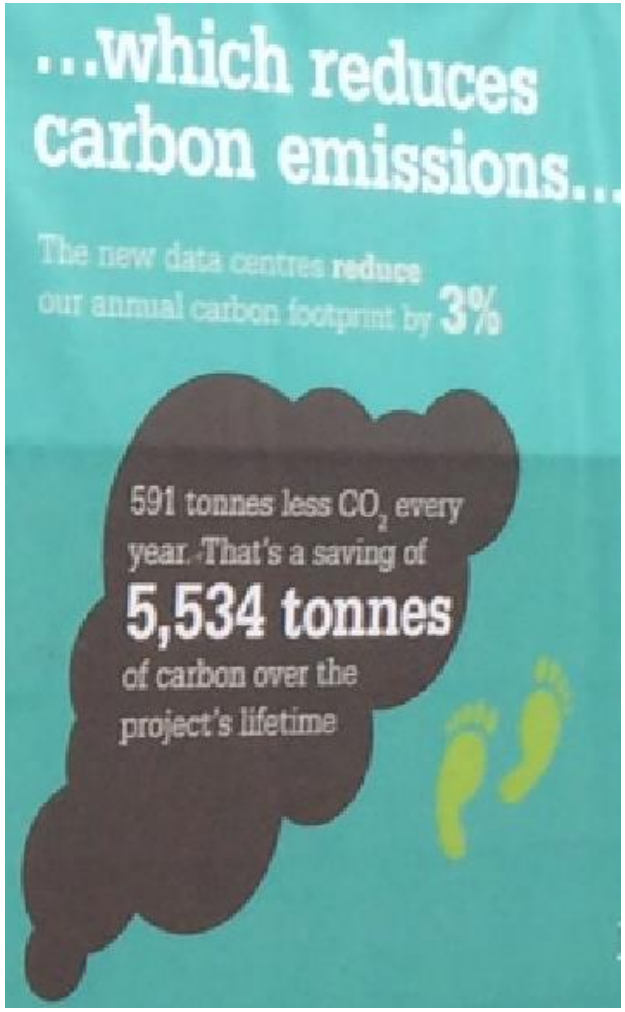
because…

Increased funding opportunities, higher priority to business, dynamic technology advances, new field of expertise

Size of the Opportunity

A case study – MMU All Saints Data Centre

Estates and Operations



- 50% Efficiency Gains
- Release of space

IT Rooms

Funded by Salix

Considering the Opportunity

… where to start?

Estates and Operations

Data Centre Space

Space is one of the first things that will need to be considered when faced with the challenge of improving the IT facility.

Location options may be one or more of the following;

- New build
- Outsourcing to a hosting company

- Upgrading existing to a more power and space efficient solution (live)
  Thermal containment / Upgrade to more efficient components / Virtualisation, etc

- Finding a new space within *or around* the estate for a more power and space efficient solution (migrate) – prefabricated?
  Virtualisation / integral or independent of building infrastructure / risk mitigation

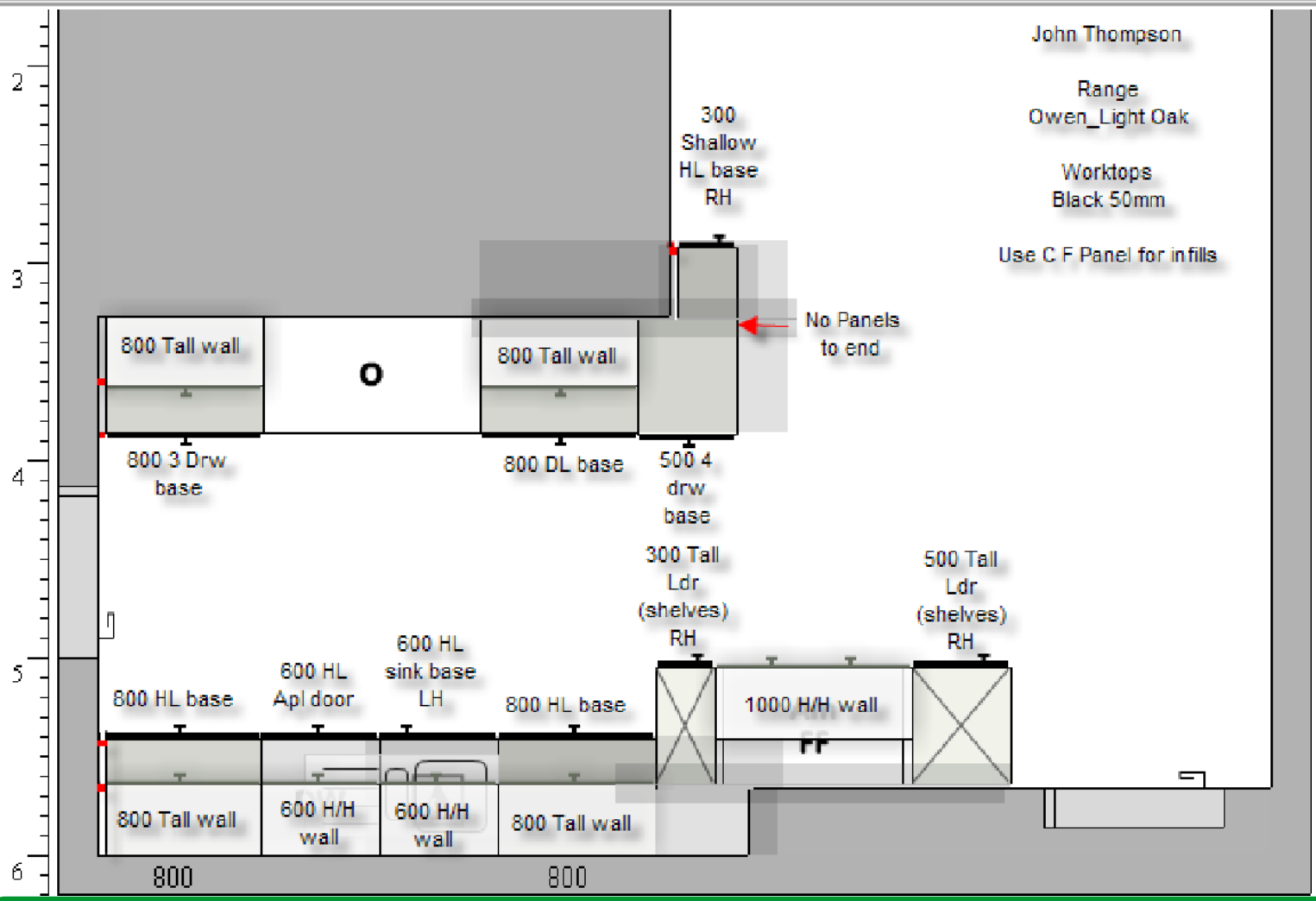
Who will decide?…

Feasability study? Consultants? In-house knowledge and expertise? (connections- Jisc guide)

Planning Tools

… tried and tested

Estates and Operations

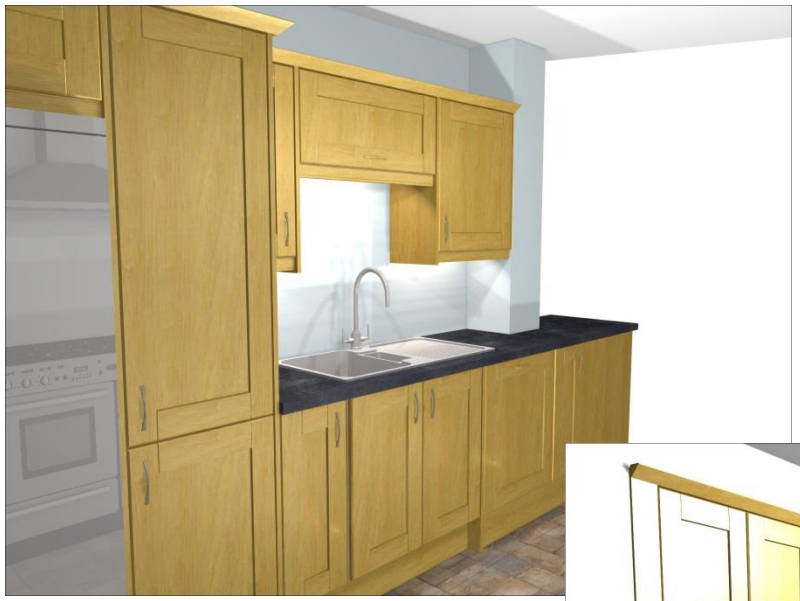


20-30 minutes to create speculative design

Walk Round

Visualising possibilities

Estates and Operations



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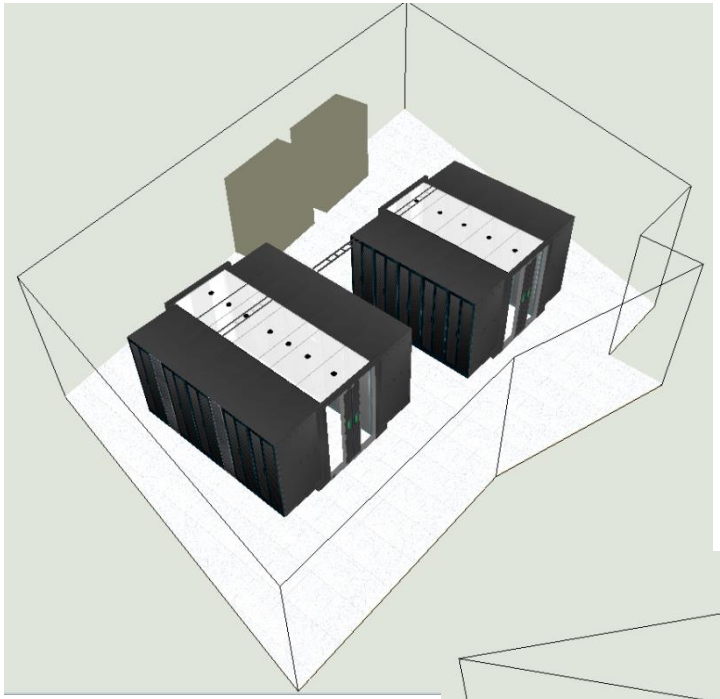

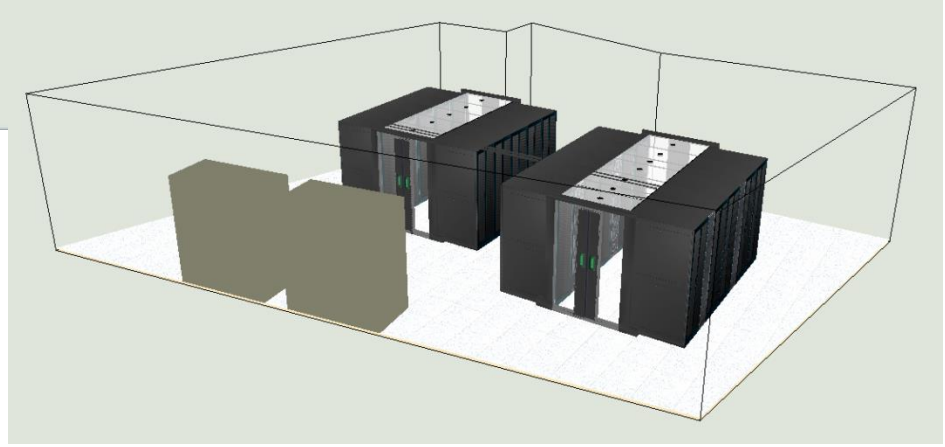

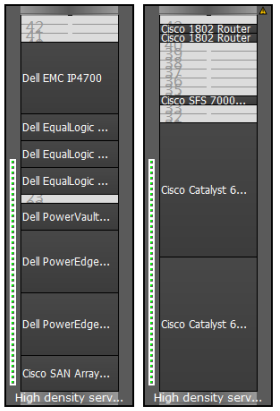

Improved communication to stakeholders

Itemised

How many, how much?

Estates and Operations

BOM & CTO Report

Details

	SKU Type	Quantity	Item	Description
ISXD Design 1 Type: ISXD				
☐	FG	20	AR3100	NetShelter SX 42U 600mm Wide x 1070mm Deep Enclosure with Sides Black
☐	FG	10	AP7557	Rack PDU, Basic, Zero U, 11 kW, 230V, (36) C13 & (6) C19
☐	FG	10	AP8858EU3	Rack PDU 2G, Metered, ZeroU, 16A, 230V, (18) C13 & (2) C19, IEC309 Cord
☐	PTO	3	AR8164AE	
☐	FG	2	AR8177BL	
☐	Purchased SKU	20	AR8561	
☐	Purchased SKU	4	AR8580	
☐	Purchased SKU	16	AR8162AE	

Data Cables

Logical Name: R/B-1
Name: Switch 10
U Position: 40
Description: APC 24 Port 10/100 Ethernet Switch
Stage: NEW

Qty	Part Number	Description
9	3827GY-10	APC CAT 5 UTP 568B PATCH CABLE, GREY, RJ45 MALE TO RJ45 MALE, 14 PAIR, 24 AWG, STRANDED, PVC, 10 FT
3	3827GY-15	APC CAT 5 UTP 568B PATCH CABLE, GREY, RJ45 MALE TO RJ45 MALE, 4 PAIR, 24 AWG, STRANDED, PVC, 15 FT
1	3827GY-25	APC CAT 5 UTP 568B PATCH CABLE, GREY, RJ45 MALE TO RJ45 MALE, 4 PAIR, 24 AWG, STRANDED, PVC, 25 FT
2	3827GY-30	APC CATEGORY 5 UTP 568B PATCH CABLE, GREY, RJ45M/RJ45M
1	3827GY-35	APC CATEGORY 5 UTP 568B PATCH CABLE, GREY, RJ45M/RJ45M
2	3827GY-40	APC CATEGORY 5 UTP 568B PATCH CABLE, GREY, RJ45M/RJ45M
1	3827GY-50	APC CAT 5 UTP 568B PATCH CABLE, GREY, RJ45 MALE TO RJ45 MALE, 4 PAIR, 24 AWG, STRANDED, PVC, 50 FT
2	3827GY-100	APC CAT 5 UTP 568B PATCH CABLE, GREY, RJ45 MALE TO RJ45 MALE, 4 PAIR, 24 AWG, STRANDED, PVC, 100 FT

Port	Connected From	Location	Stage	Data Cables	Connected To	Location	Stage	# Extenders
1	AP9465	R/B-1	NEW	3827GY-10	AP9224110	R/B-1	NEW	0
2	AP9224110	R/B-1	NEW	3827GY-10	AP8858EU3	R/B-1	NEW	0
3	AP9224110	R/B-1	NEW	3827GY-10	AP8858EU3	R/B-3	NEW	0
4	AP9224110	R/B-1	NEW	3827GY-10	NBRK0451	R/B-3	NEW	0
5	AP9224110	R/B-1	NEW	3827GY-10	ACRC301H	C/L-2	NEW	0

Drill down into detail / Connections / Product Specs

Quick Decisions

… saving time and money

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Seeing the potential

Maximising Potential

… products to solutions

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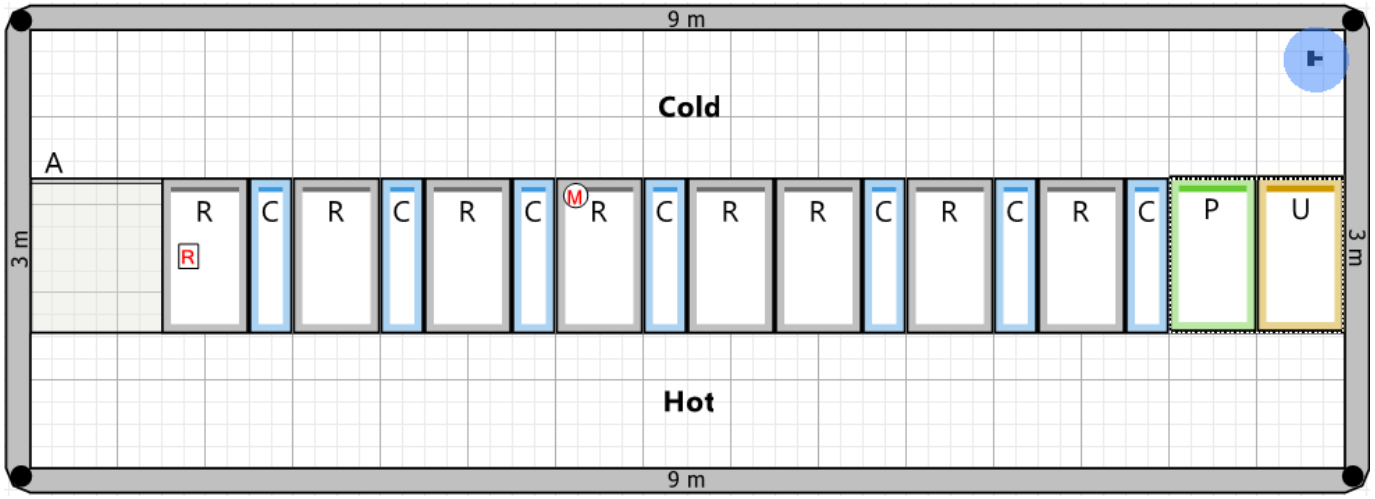


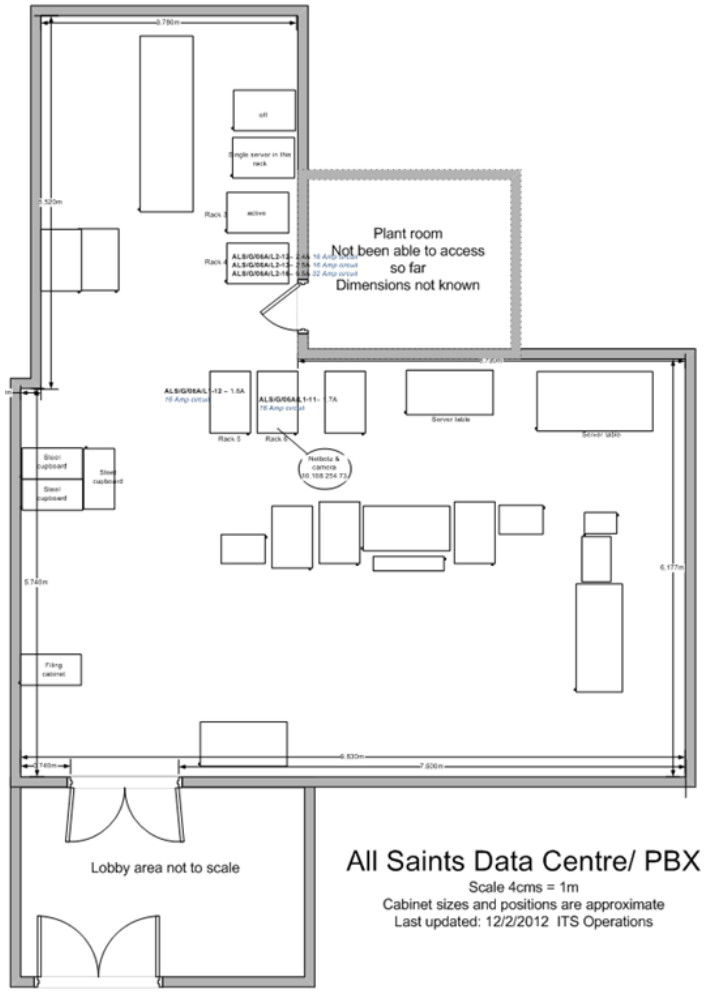
P = Service Bypass and PDU
U = UPS
R = Rack
C = In Row Cooling Unit
M&R = Central Management System & NetBotz
= Camera
A = row references

Not to scale:
600mm x 600mm grid

Quick and easy speculative designs

MMU Case Study

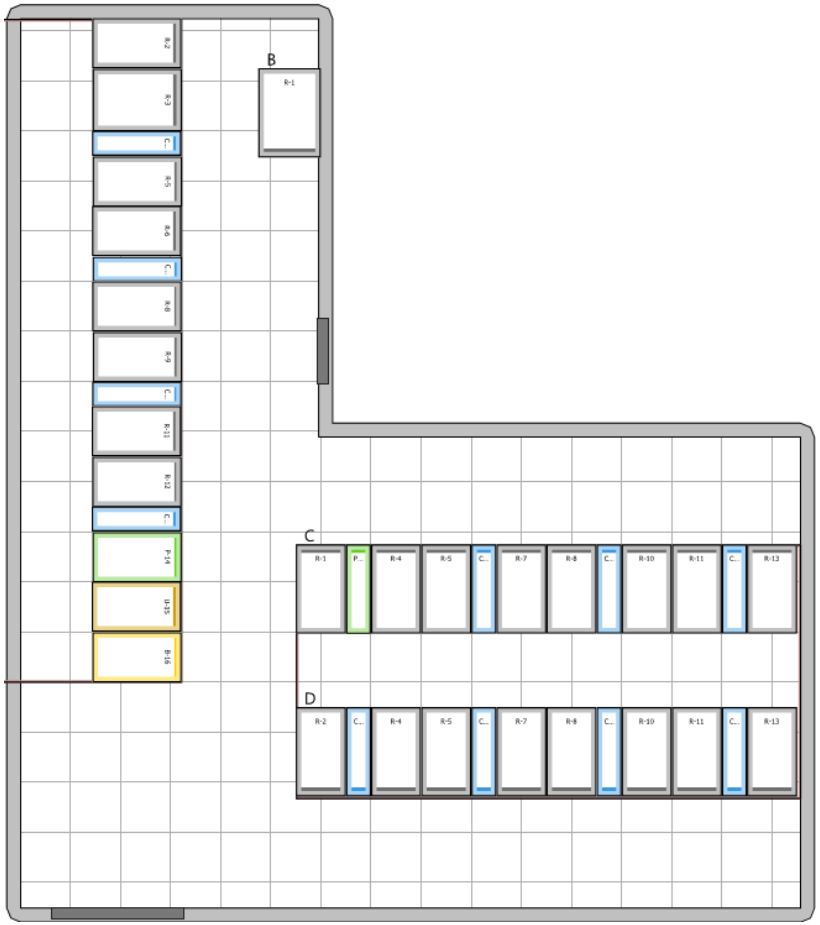
Estates and Operations

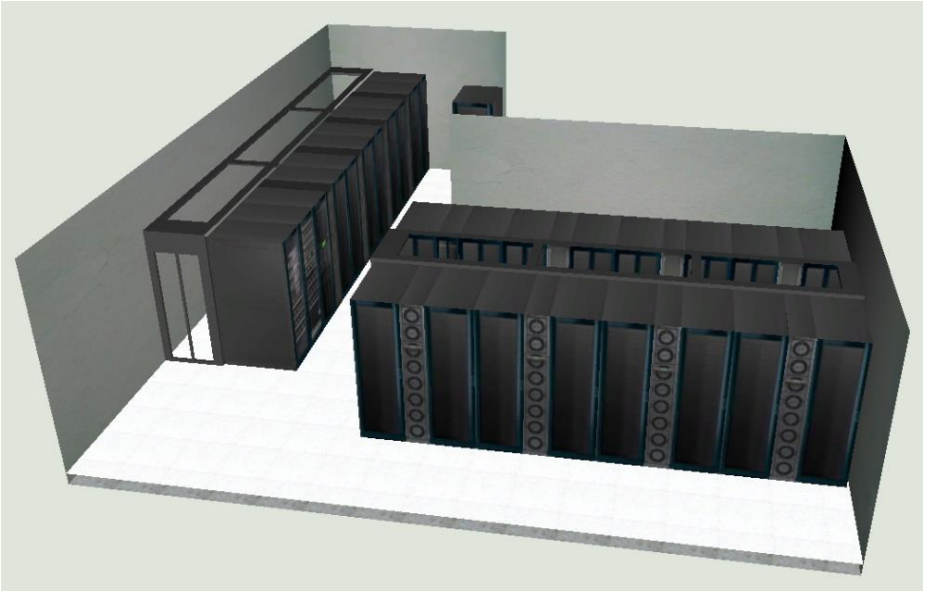


Old PABX room with live services to remain operational

MMU Case Study

Estates and Operations





The best of many not so perfect options

MMU Case Study

Estates and Operations

External plant

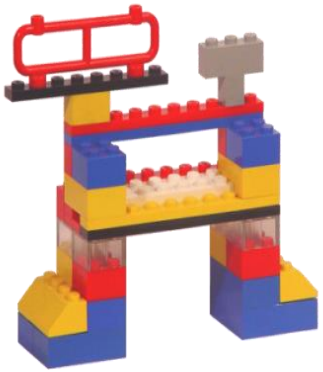
MMU Case Study

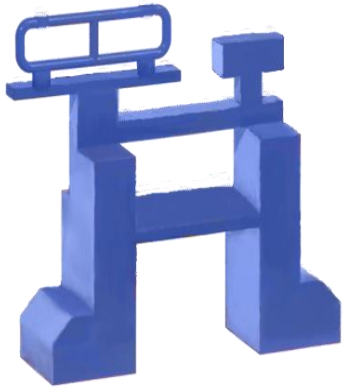
Estates and Operations

Taken 4% off overall MMU target reduction of 25%

Next Step in Modularity

Estates and Operations





Modular Data Center

- The “system” approach to design and construction
- Improves reliability
- Decreased installation time and design effort
- Grow infrastructure in whitespace with demand

Prefabricated Data Center

- Modularity in larger building blocks.
- Pre-assembled systems, delivered on-site, factory tested.
- System-optimized designs with onboard management systems.
- Grow entire infrastructure with demand
- Quick installation, reduced commissioning time

Introducing the Prefabricated Multi Modular Solution

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Simplify Lifecycle Services with Prefabrication

Estates and Operations

Minimize design work to module and site layout, common connections, and local codes

Reduce on-site construction and coordination

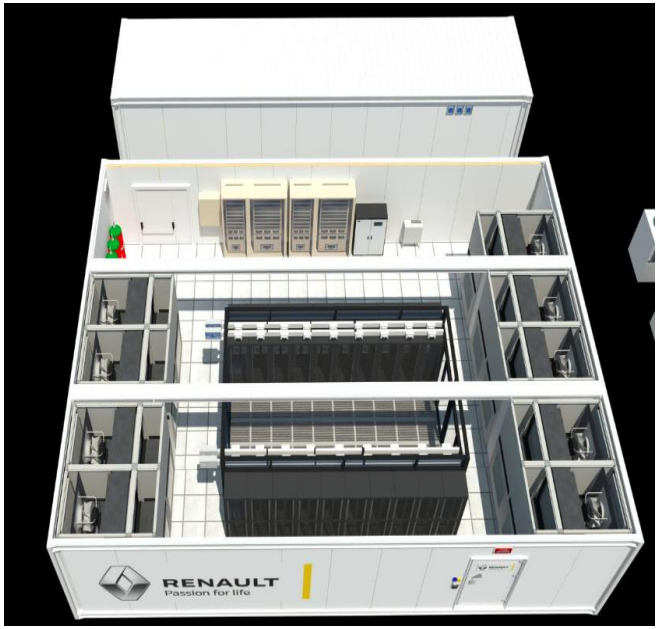
Simplify planning process with 35 Prefab Reference Designs

Minimize on-site programming and configuration with integrated DCIM software

Are Prefabricated Data Center Module the right fit?

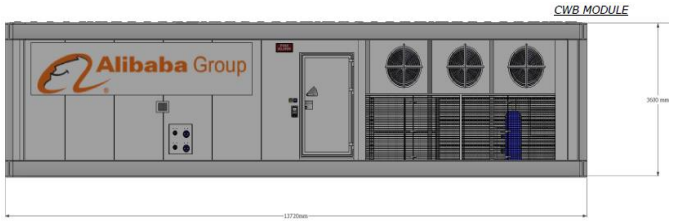
Conceptual Design Solution Layouts and 3Ds

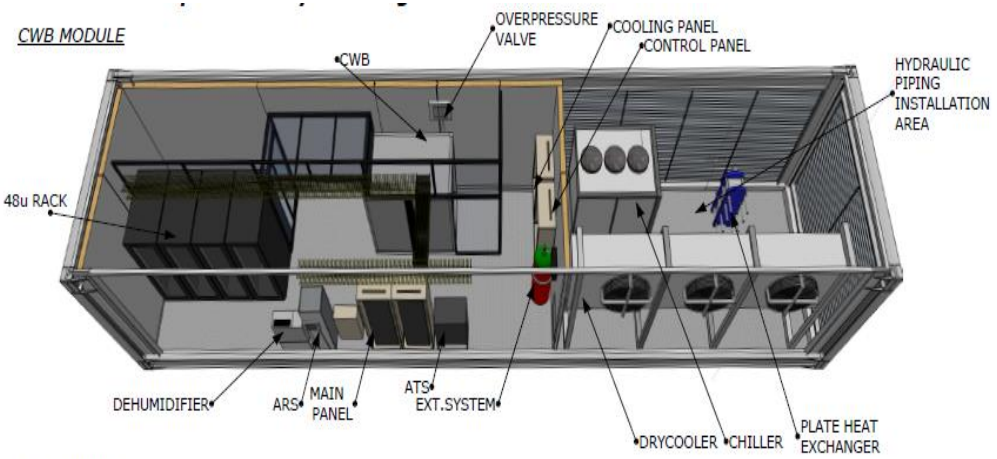
Estates and Operations

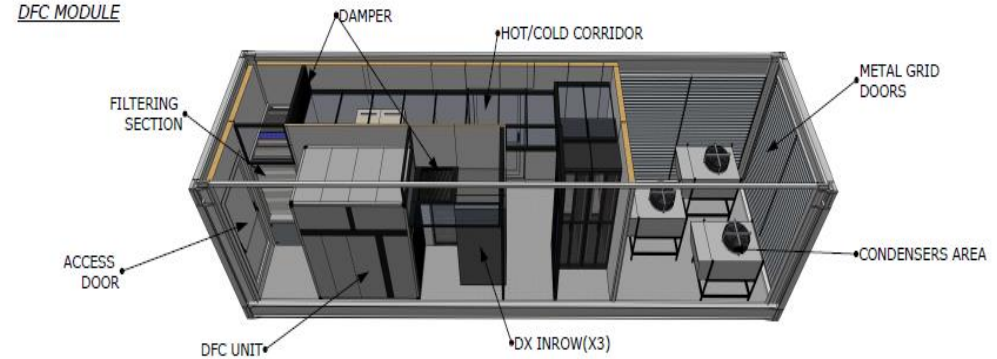


Conceptual Design Solution Layouts and 3Ds

Estates and Operations







Common Applications where Prefabrication Adds Value

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Scalable Solutions for Large Scale Deployments

Quick Deploy, Pre-Engineered Solutions for Education

What is a Prefabricated Data Centre Module

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- A prefabricated modular data centre can be defined as a data centre that is made up of at least one pre-engineered, factory-integrated, and pre-tested assembly of subsystems that have traditionally been installed separately onsite

- Prefabricated Data Centers are further defined by according to their
  - Function: Power, Cooling, IT
  - Form Factor: ISO Container, Enclosure, Skid-Mounted
  - Configuration: Fully-Prefabricated, Semi-Prefabricated

SmartBunkers for Distributed IT

Estates and Operations

SmartBunker SX
Traditional for IT rooms

- 24 and 42U
  - > 3 or 5kVA UPS
  - > Netbotz environmental monitoring
  - > 1 Switched Rack PDUs
  - > Passive cooling

SmartBunker CX
Optimized for office environments

- 24U and 38U
  - > 3 or 5kVA UPS
  - > Netbotz environmental monitoring
  - > 1 Switched Rack PDUs
  - > Sound proofing
  - > Fan-assisted ventilation

SmartBunker FX
Industrial Environments

- 23U and 42U
  - > 5 and 8kVA UPS
  - > Electrical Input panel
  - > Netbotz environmental monitoring
  - > 1 Switched Rack PDUs
  - > Active DX cooling solutions
  - > Thermal insulation
  - > Sealed enclosure

SmartBunker CX Features and Components

Estates and Operations

Superior sound proofing on all interior surfaces. Clean, decorative exterior to match office decor

Fire suppression

Security and Environmental Monitoring

- Surveillance Cameras
- Alarm beacon
- Temp. &Hum. sensors
- Smoke detector
- Leak Rope Sensor

DCIM software for remote management and real-time monitoring

Metered rack PDU with remote monitoring

UPS with remote management

Fan-assisted cooling

IT equipment can be installed in an office space without the cost of building a dedicated IT room

SmartBunker FX Features and Components

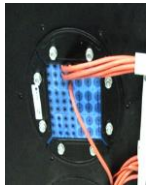
Estates and Operations

StruxureWare Data Center Expert software for remote management and real-time monitoring

Security and Environmental Monitoring
- Surveillance Cameras
- Alarm beacon
- Temp. &Hum. sensors
- Smoke detector
- Leak Rope Sensor

Multi-point locking door and Netbotz Rack Access proximity card locking system

Switched and metered rack PDU with remote monitoring



Fire-rated and sealed cable entries

UPS with remote management

InRow self-contained, active DX cooling with monitoring, controls, and display

> Superior physical protection with heavy gauge steel construction

> Thermally Insulated walls keep cold air in and hot air out

> Wall construction provides superior sound attenuation

> Front and rear access with 180° doors

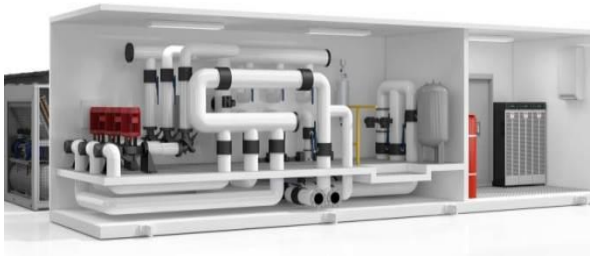
Micro Data Centres

Estates and Operations

A focus across all data centre applications **from micro and edge to small server rooms to cloud & mega data centres**

A full range of products and systems designed for specific applications

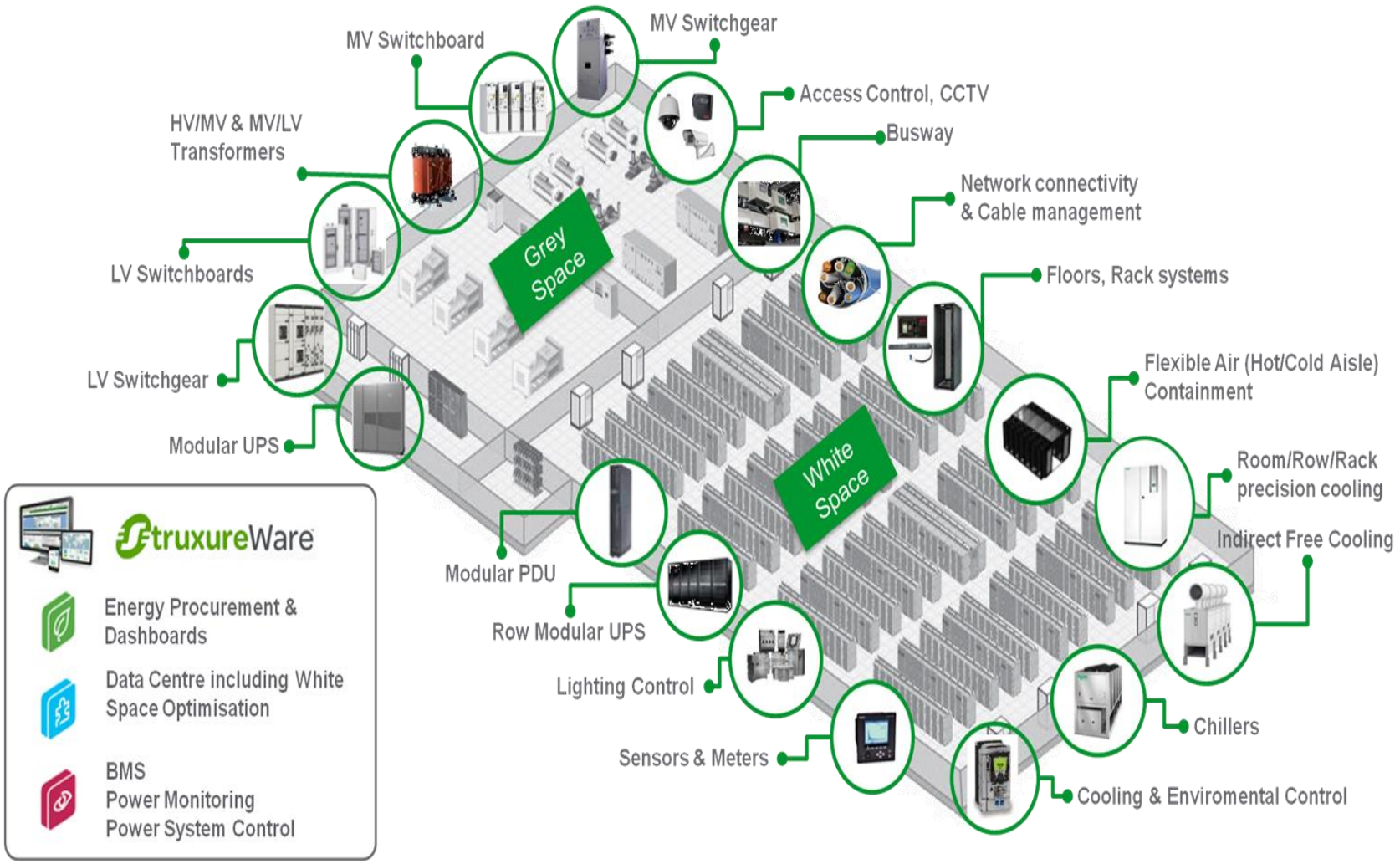
- MicroDC, Edge, Server and Network Rooms
  fully fledged power, cooling and IT from ½ rack to 100kW
- Prefabricated DC
  a full range of power, cooling, IT or all-in-ones from 100kW to 2MW
- Cloud, enterprise, co-location and service providers
  power, cooling and IT products, systems and services for any size
- Web-giants
  power, cooling and IT products, systems and services for any size including Open Compute products and systems



Total Data Centre Solutions

Estates and Operations

A complete portfolio of data center products and systems from rack to row and from room to building



Learning and Legacy

Estates and Operations

•‘Learning and Legacy: The Role of Education in Creating Healthier, Happier Cities,’ considers the role tertiary education institutions play in encouraging community cohesion, connecting stakeholders, driving social and business innovation and acting as a catalyst for change to influence future generations.

•Throughout your presentation, please consider how your workshop focus/topic can play a part in helping to create community cohesion.